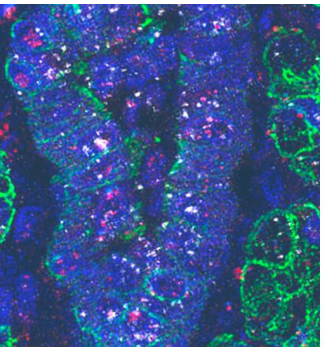
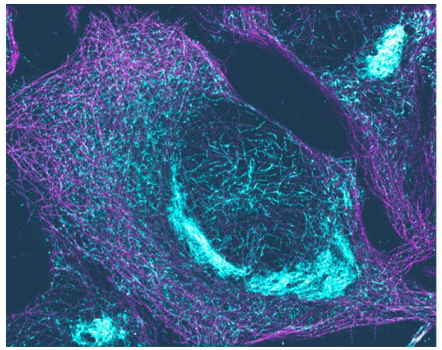
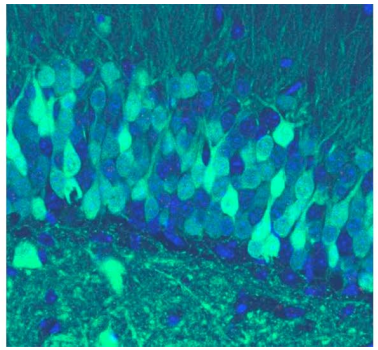
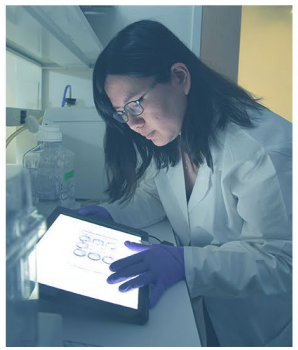
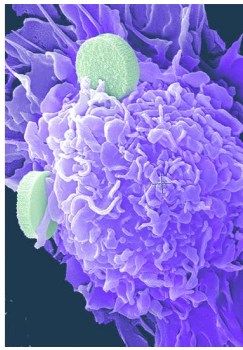
Improving Health Through Biomedical Research: Guiding Principles and an Orientation to NIH

University of Kentucky
June 10, 2024





Monica M. Bertagnolli, MD
Director, National Institutes of Health

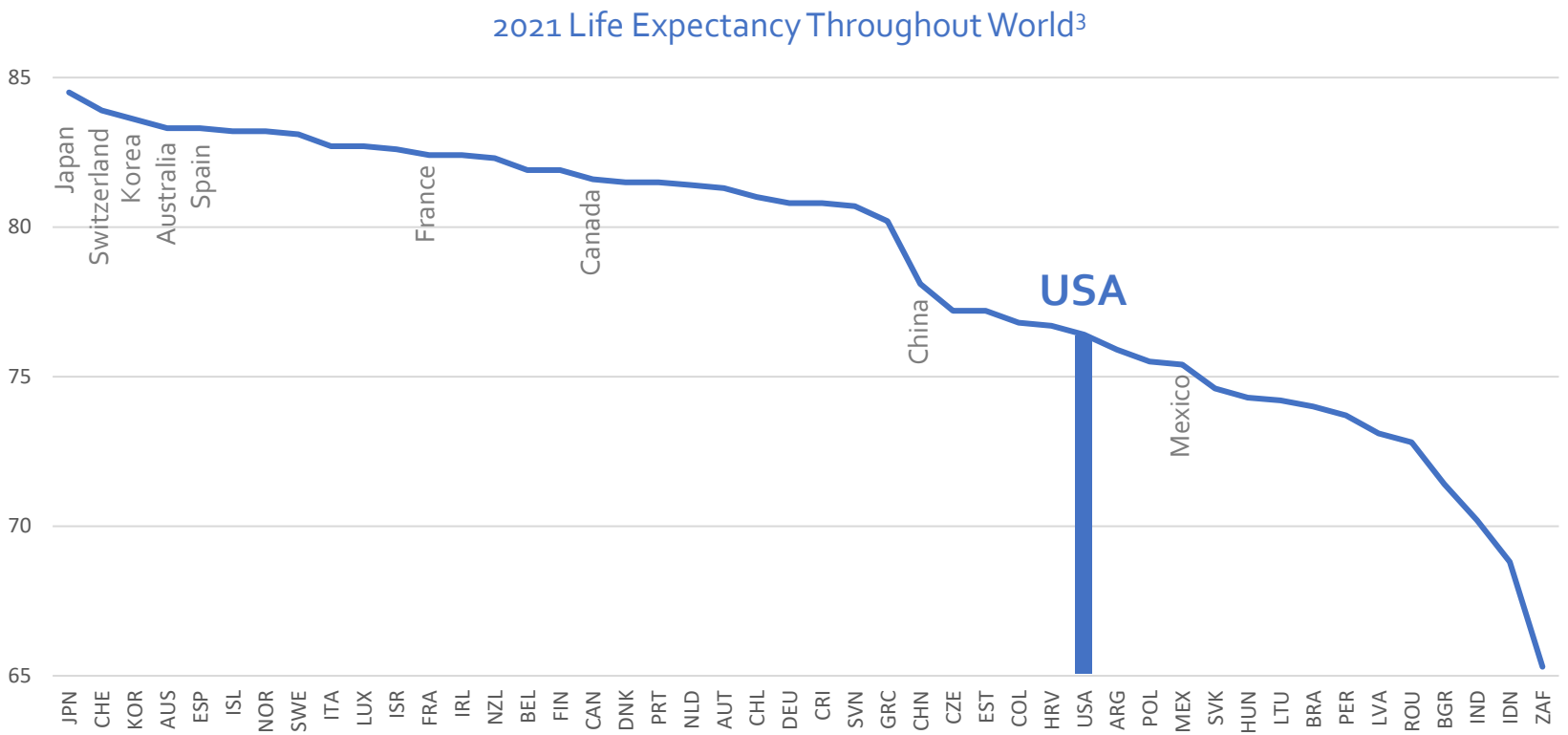
Topics for Today

- Introduce myself
- Disturbing trends in health
- Guiding principles and NIH priorities
- An introduction to NIH
- NIH Funding


HEALTH &
ERVICES

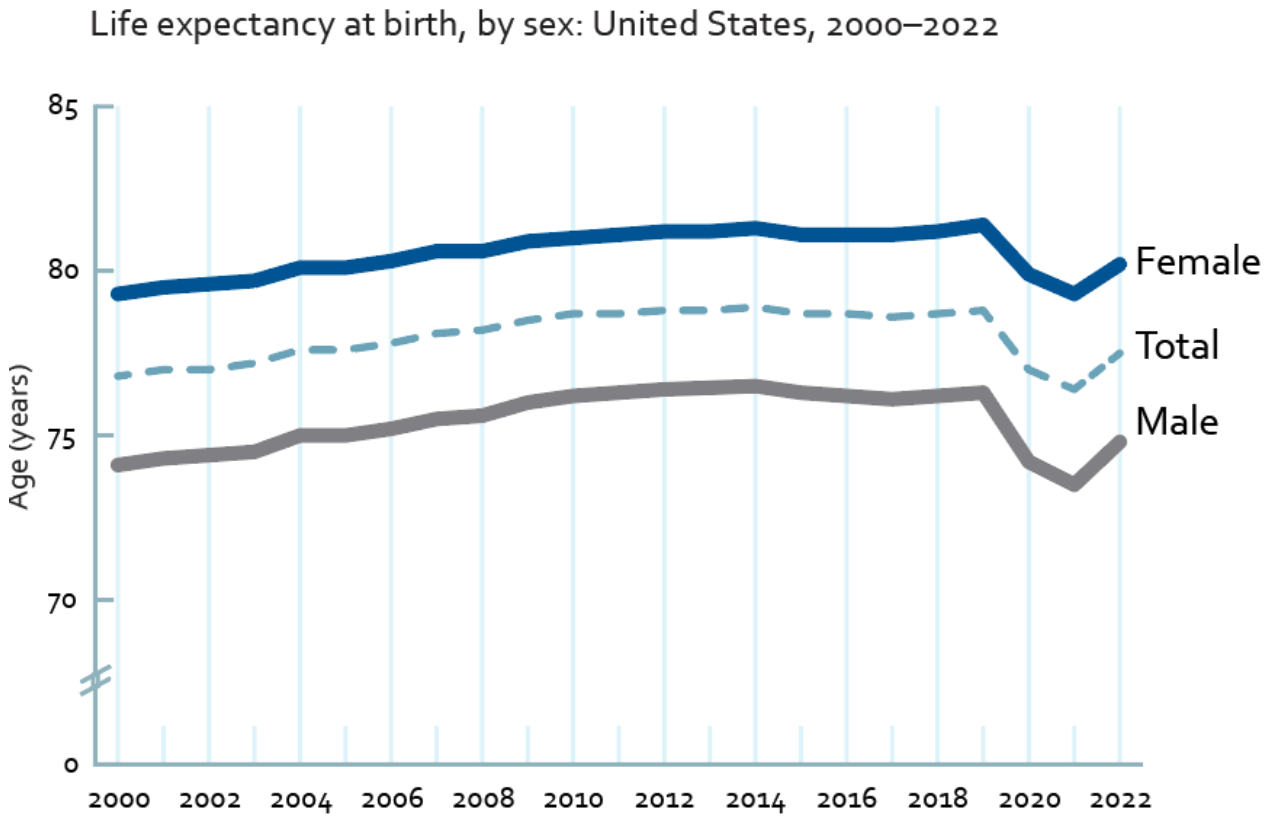

The health of the U.S. population is declining.

U.S. life expectancy ranks low among peers



(1) National Academies of Sciences, Engineering, and Medicine. 2021. *High and Rising Mortality Rates Among Working-Age Adults*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25976.
(2) Arias E, Kochanek KD, Xu JQ, Tejada-Vera B. Provisional life expectancy estimates for 2022. Vital Statistics Rapid Release; no 31. Hyattsville, MD: National Center for Health Statistics. November 2023. https://dx.doi.org/10.15620/cdc:133703.
(3) Chart data: OECD (2024), Life expectancy at birth (indicator). DOI: 10.1787/27e0fc9d-en (Accessed on 10 January 2024)

U.S. life expectancy is no longer steadily increasing



NOTES: Estimates are based on provisional data for 2022. Provisional data are subject to change as additional data are received. Estimates for 2000–2021 are based on final data.
SOURCE: National Center for Health Statistics, National Vital Statistics System, mortality data file.

Working-age adults are dying at higher rates

2021 NAS report: Mortality increased among adults ages 25-64 years from 1990 to 2017.

Main drivers:

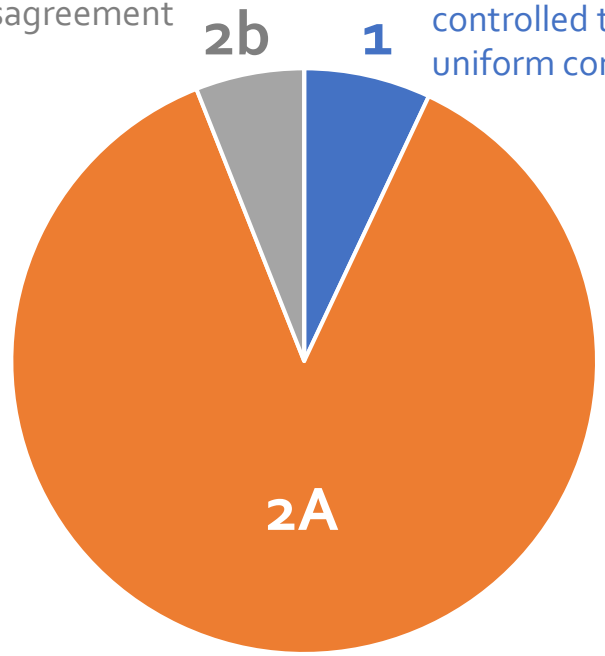
- Drug poisonings and alcohol-induced causes
- Suicide
- Cardiometabolic diseases

National Academies of Sciences, Engineering, and Medicine. 2021. *High and Rising Mortality Rates Among Working-Age Adults*. Washington, DC: The National Academies Press. https://doi.org/10.17226/25976.

Levels of evidence supporting treatment guidelines

Lower level of evidence
without a uniform consensus but with no major disagreement

High level evidence
such as randomized controlled trials with uniform consensus



Lower level of evidence
with uniform consensus

Int J Cancer. 2021 Jan 15;148(2):429-436. doi: 10.1002/ijc.33215. Epub 2020 Aug 14.

Category of evidence and consensus underlying National Comprehensive Cancer Network guidelines: Is there evidence of progress?

Aakash P Desai [1], Ronald S Go [2], Thejaswi K Poonacha [3]

NCCN Levels of Evidence

7%	**Category 1:**	High level evidence such as randomized controlled trials with uniform consensus
87%	**Category 2A:**	Lower level of evidence with uniform consensus
6%	**Category 2B:**	Lower level of evidence without a uniform consensus but with no major disagreement
0%	**Category 3:**	Any level of evidence but with major disagreement

People who are not adequately represented in clinical research

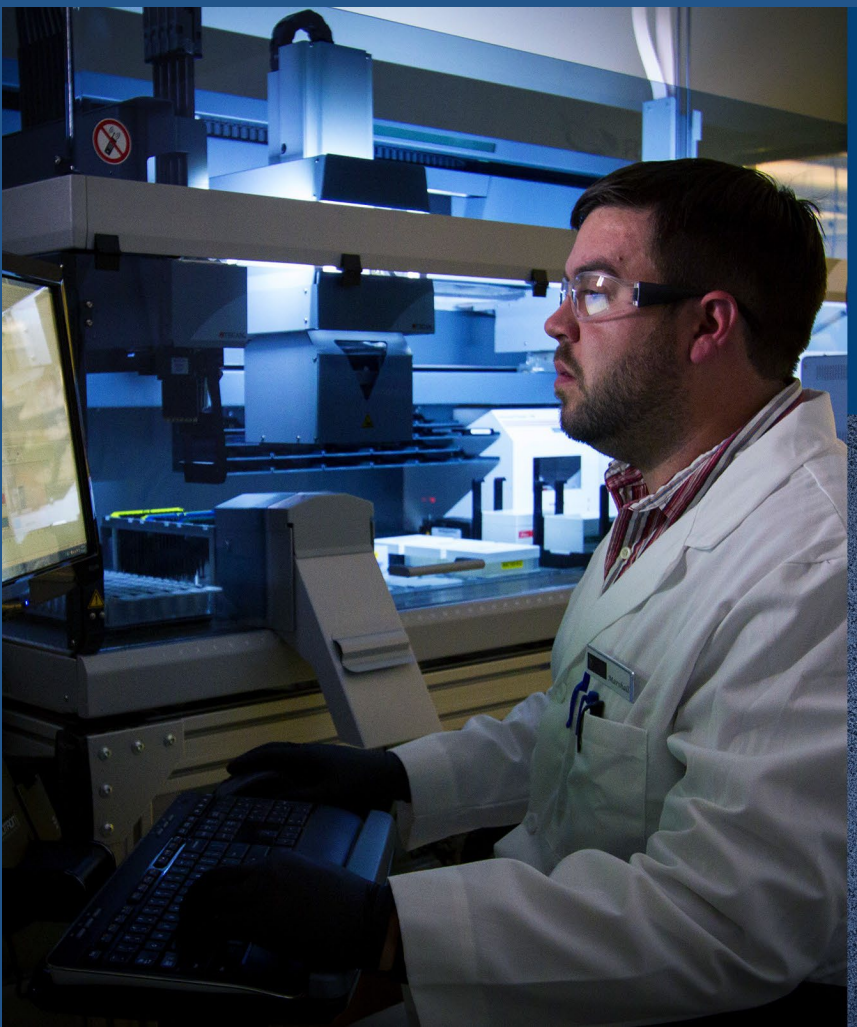
- Are older
- Are uninsured
- Belong to minority groups
- Live in rural locations
- Have co-morbid conditions
- Are more likely to receive non-standard treatment

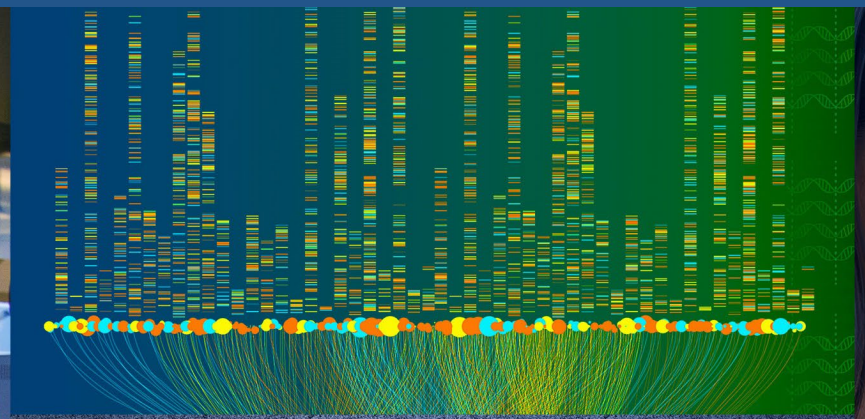
Guiding Principles

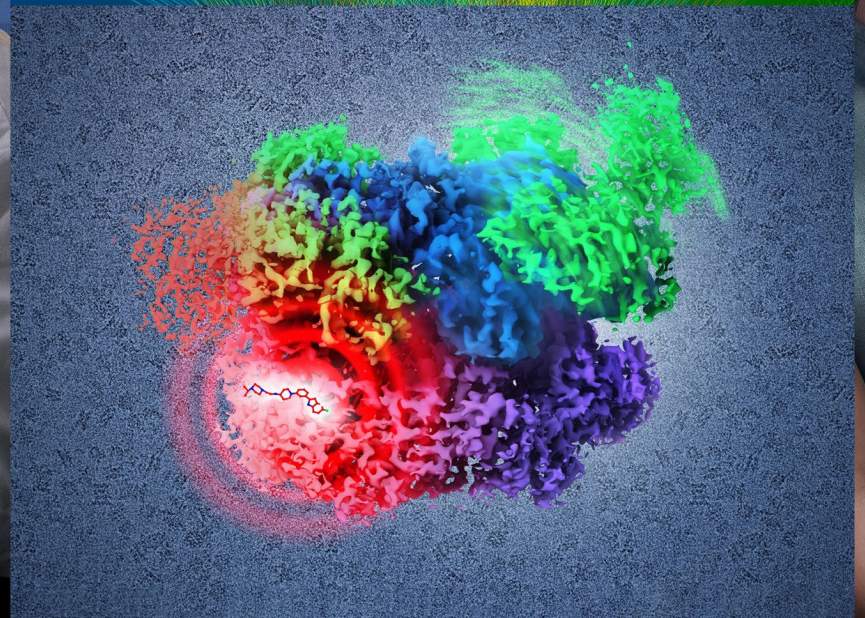
Our work is not finished when we deliver scientific discoveries, our work is finished when all people are living long and healthy lives.

NIH research encompasses the laboratory, the clinic, and the community.

Progress is accelerated when advanced scientific methods, such as new data analytics, are applied to data that includes everyone, and when new discoveries are rapidly and equitably adopted in clinical care.







What Should NIH Do?

Connect research to primary care

Community-based primary **C**are practices **A**dvancing **R**esearch **E**quity **for Health**

CARE for Health™

Conduct research addressing **issues important to diverse communities**, particularly those **underrepresented** in biomedical research

Reduce burden on providers using innovative data collection methods

Increase adherence to **evidence-based care**

Improve **efficiency of care delivery**

Integrate research into the clinical care environment

Engender trust in science by addressing community needs

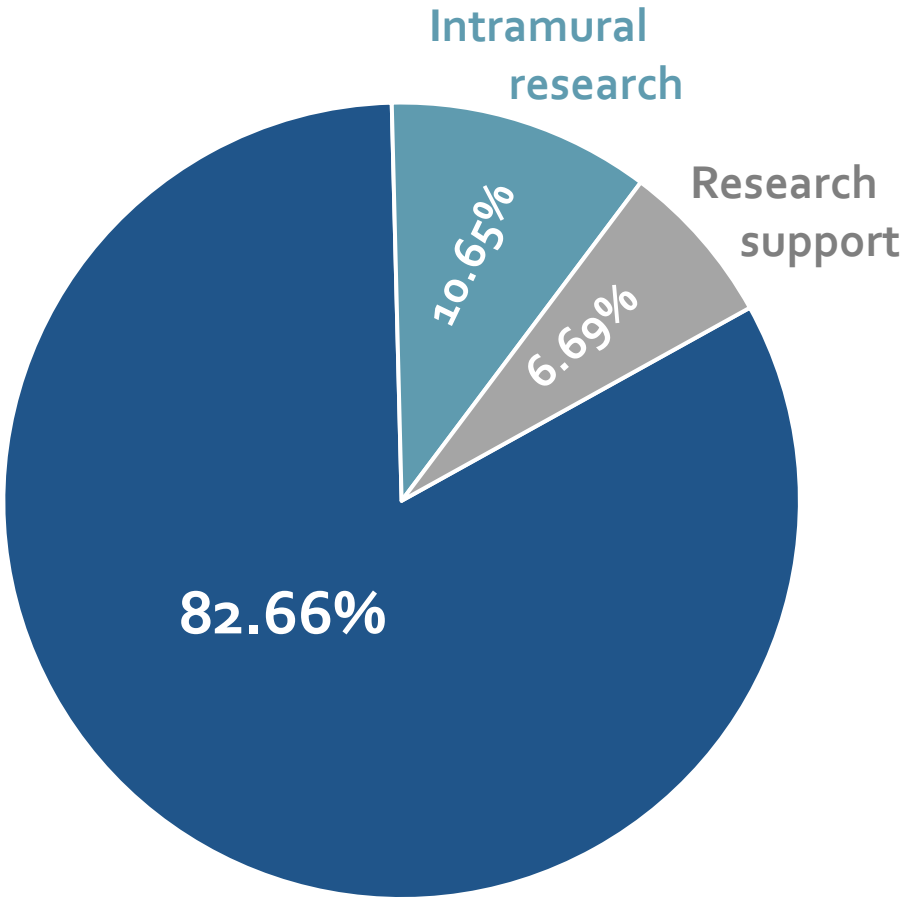
Achieve **longitudinal collection of clinical data** to address health across the lifespan


NIH 101

NIH Institutes and Centers

Cancer (NCI)	Eye (NEI)	Heart, Lung & Blood (NHLBI)	Human Genome (NHGRI)	Aging (NIA)	Alcoholism (NIAAA)
Allergy & Infectious Diseases (NAID)	Arthritis, Musculoskeletal & Skin Diseases (NIAMS)	Biomedical Imaging & Engineering (NIBIB)	Child Health (NICHD)	Deafness & other Comm. Disorders (NIDCD)	Dental & Craniofacial (NIDCR)
Diabetes & Digestive & Kidney (NIDDK)	Drug Abuse (NIDA)	Environmental Health (NIEHS)	General Medical Sciences (NIGMS)	Mental Health (NIMH)	Minority Health & Health Disparities (NIMH)
Neurological Disorders & Stroke (NINDS)	Nursing (NINR)	Library of Medicine (NLM)	Clinical Center (CC)	Information Technology (CIT)	Scientific Review (CSR)
Fogarty International (FIC)	Translational Sciences (NCATS)	Complementary & Integrative Health (NCCIH)			

NIH Funding
(FY 2023 - $47.3B)



Spending outside NIH

- Research project grants at universities, medical schools
- Research centers
- Other research grants
- Research training
- R&D contracts

Spending at NIH

- Projects conducted by NIH scientists
  10.65% of budget
- Research management and support
- Other (administrative, construction, maintenance, operational costs)

NIH Extramural Program By the Numbers

Recruits
28,000 reviewers

~12,000
Grad Students

>28,000 Postdocs

~350,000
NIH-supported
researchers

~80,000
Applications of many types
reviewed

~55K research project
applications (~11.3K awards)
in all 50 states and DC

>2,800
NIH-funded institutions

169
Nobel Prize winners

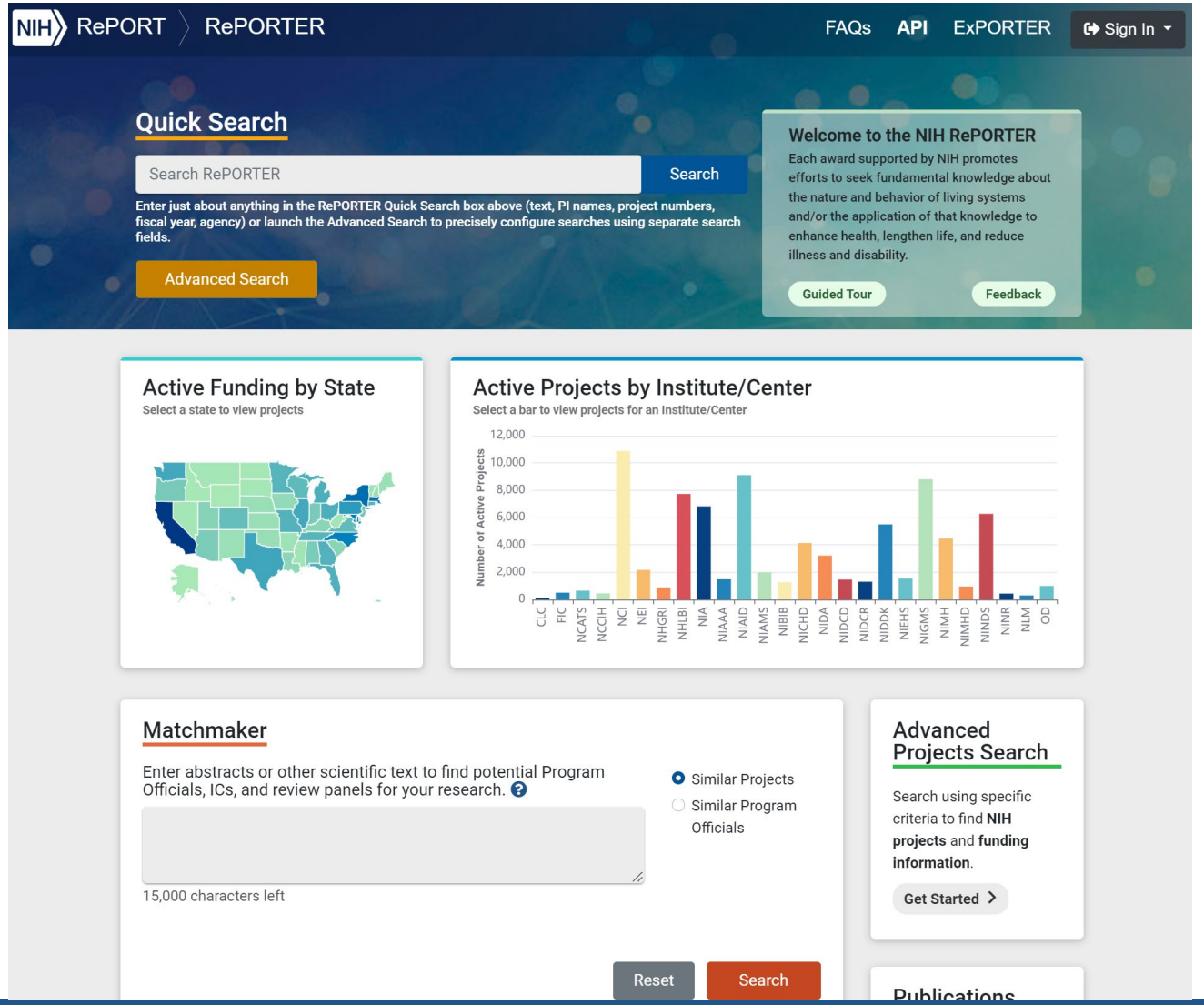
NIH's Approach

- Majority of funding: investigator-initiated research
- NIH also develops initiatives to foster the acceleration of knowledge

Finding funding opportunities

- Matchmaker tool in NIH RePORTER
- Browse strategic plans, portfolio areas, research priorities
- Use NIH Guide to identify relevant notices of funding opportunities (NOFOs).

reporter.nih.gov/matchmaker
grants.nih.gov/funding/searchguide



Identify the right grant type

Graduate/Medical Student

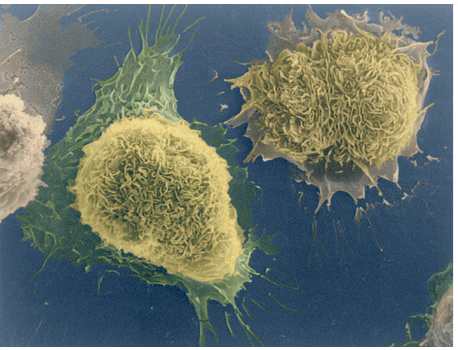
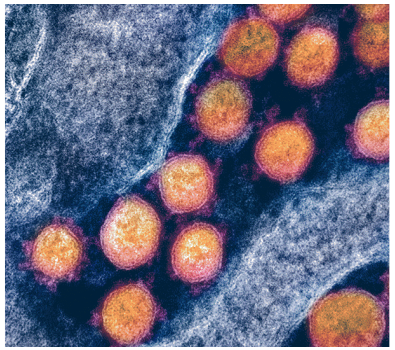
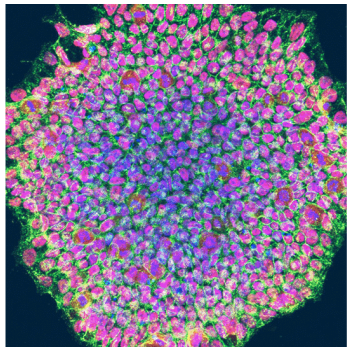
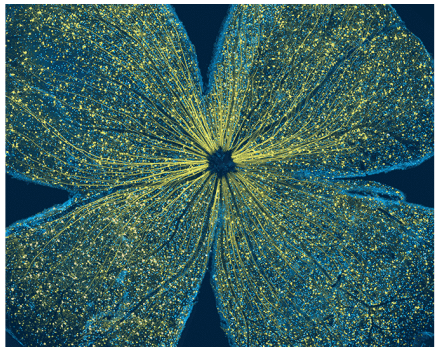
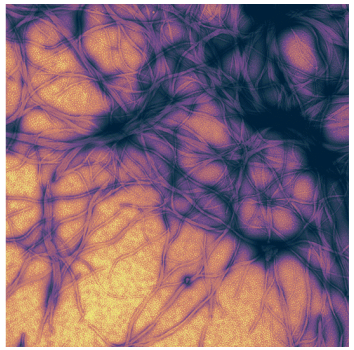
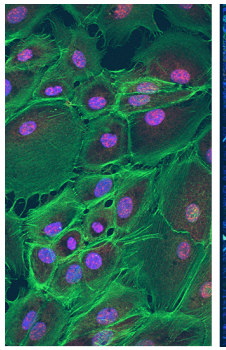
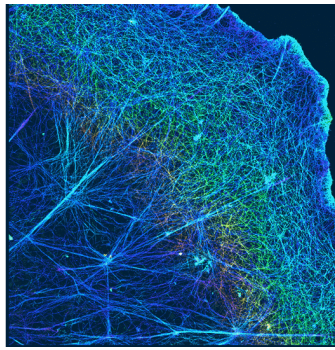
- Dissertation Grant: R36
- NRSA Fellowships: F30, F31
- Institutional Training Grant: T32
- Research Residency (MDs): R25
- Diversity Supplements

Postdoctoral Fellow

- NRSA Fellowship: F32
- K-Awards: K99/R00
- Institutional Training Grant: T32
- Research Education Grant: R25
- Diversity Supplements
- Loan Repayment Program

Early-Career Faculty

- K-Awards: K01, K08, K23
- Research Education Grant: R25
- Research Project grants: R01, R21, R03
- Diversity Supplements
- Loan Repayment Program

NIH

Turning Discovery Into Health